

Title: Carnival Capers!!

Brief Overview:

In Carnival Capers, the students will collect, organize, display, and analyze data. They will be presented with a real life situation in which they will be opening three different booths at a carnival. This unit consists of graphing and probability activities.

Links to NCTM 2000 Standards:

- **Standard 1: Number and Operation**

Mathematics instructional programs should foster the development of number and operation sense so that all students understand numbers, ways of representing numbers, relationship among numbers, and number systems.

- **Standard 5: Data Analysis, Statistics, and Probability**

Mathematics instructional programs should include attention to data analysis, statistics and probability so that all students pose questions and collect, organize, and represent data to answer those questions; interpret data using methods of exploratory data analysis; develop and evaluate inferences and arguments that are based on data; and understand and apply the basic notions of chance and probability.

- **Standard 6: Problem Solving**

Mathematics instructional programs should focus on solving problems as part of understanding mathematics so that all students build new mathematical knowledge through their work with problems; develop a disposition to formulate, represent, abstract and generalize in situations within and outside mathematics; apply a wide variety of strategies to solve problems and adapt the strategies to new situations; and monitor and reflect on their mathematical thinking in solving problems.

- **Standard 7: Reasoning and Proof**

Mathematics instructional programs should focus on learning to reason and construct proofs as part of understanding mathematics so that all students recognize reasoning and proof as essential and powerful parts of mathematics; and develop and evaluate mathematical arguments and proofs;

- **Standard 8: Communication**

Mathematics instructional programs should use communication to foster an understanding of mathematics so that all students organize and consolidate their mathematical thinking to communicate with others; express mathematical ideas coherently and clearly to peers, teachers, and others; and use the language of mathematics as a precise means of mathematical expression.

- **Standard 9: Connections**

Mathematics instructional programs should emphasize connections to foster an understanding of mathematics so that all students recognize and use connections among different mathematical ideas; and recognize, use and learn about mathematics in contexts outside of mathematics.

- **Standard 10: Representation**

Mathematics instructional programs should emphasize mathematical representations to foster an understanding of mathematics so that all students create and use representations to organize, record and communicate mathematical ideas; develop a repertoire of mathematical representations that can be used purposefully, flexibly, and appropriately; and use representations to model and interpret physical, social, and mathematical phenomena.

Grade/Level:

Grades 3-4

Duration/Length:

This unit will take approximately 2 one hour classes.

Prerequisite Knowledge:

Students should have working knowledge of the following skills:

- Tally marks
- Bar graph
- Probability
- Writing an informative paragraph
- Number Sense
- Identifying fourths, halves, and eighths

Student Outcomes:

Students will:

- gather, organize, display, and interpret data.
- determine probability of an event.
- construct a fair spinner.
- use mathematical language and reasoning when writing to inform.

Materials/Resources/Printed Materials:

- Student Resource Sheets #1 - 7
- Teacher Resource Sheets #1 - 2
- Crayons
- Paper Clips (for spinners)

Development/Procedures

Activity 1

- The teacher will present students with Student Resource Sheet #1 (Introduction).
- The students will circle their favorite soda, ice cream, and candy at the bottom of that sheet (Teacher may choose to use taste test to tally.).
- The students will come to the board and tally their choices on the tally chart (teacher prepared). They will copy the results onto their own tally chart (Student Resource Sheet # 2A).
- The teacher, as a review, will model how to display the information on the soda tally chart on a bar graph (Student Resource Sheet # 2B). **Note:** Choose the worksheet that best meets the needs of your students.
- The students will independently display the data from the tally charts on ice cream and candy in bar graphs (Student Resource Sheet #2B).
- The students will assess their bar graphs using the check list at the bottom of Student Resource Sheet #2B. Teachers can use the provided bar graph rubric (Teacher Resource Sheet # 1).

Activity 2

- Teacher will distribute the writing prompt for the business letter to the PTA (Student Resource Sheet #3). If desired, final copy template is provided: Student Resource Sheet #7
- The student will write to the PTA to inform them of the products they will be purchasing. They will only choose three from each category and will explain their choices using the bar graphs. Note: These should be the top 3 in each category.
- The students will use a rubric (Teacher Resource Sheet #2) to assess their writing. Teacher may use this for a writing grade and/or communication grade.
- Optional Grading Scale: 45-50 = A; 40-44 = B; 35 - 39 = C; 30 - 34 = D;
33 and below = E

Activity 3

- The teacher will distribute Introduction for fourth grade spinner booth (Student Resource Sheet #4).
- The teacher will review fair and unfair games.
- The students will complete Student Resource Sheet #4.

- The teacher will distribute Student Resource Sheet #5 and the students will design a fair spinner to be used at the carnival and answer question at the bottom of the page.
- The students (in pairs) will test their spinners using a paper clip and pencil. Record the data collected on a separate piece of paper.
- Students will complete a math journal entry (Student Resource Sheet #6) This can also be answered in a math notebook.

Performance Assessment:

Students and teachers can use the check list at the bottom of Student Resource Sheet #2A or #2B to assess the bar graphs or they may use the full rubric for bar graphs provided. In addition, a rubric is provided for the writing prompt.

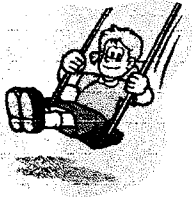
Extension/Follow Up:

- Design a poster advertising one of the booths and/or the carnival.
- In cooperative groups, students may create another booth focusing on a mathematical concept.
- Write a short play or skit to be performed at the carnival.
- Create a probability game using dice (number cubes).
- Use graphing or probability programs on computers if available.

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Introduction



Your school is planning a carnival to raise money for new playground equipment. Your 3rd grade class is responsible for the snack booth. You will be selling soda, ice cream and candy. The PTA will supply you with the money to purchase your items.

Circle your favorite soda below:

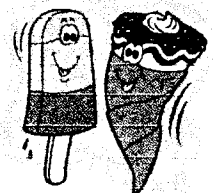
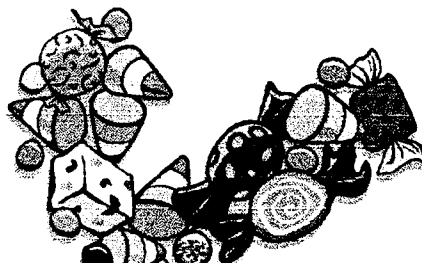
Coke Pepsi Dr. Pepper Sprite Mt. Dew

Circle your favorite ice cream flavor below:

Chocolate Vanilla Strawberry Chocolate Chip Cookies & Cream

Circle your favorite candy below:

3 Musketeers Twix Snickers M & M's Licorice



Name _____ Date _____

TALLIES

Directions: Record your data on the tally charts below.

Number of Votes for Soda

Totals

Coke	
Pepsi	
Dr. Pepper	
Sprite	
Mt. Dew	

Number of Votes for Ice Cream

Totals

Chocolate	
Vanilla	
Strawberry	
Chocolate Chip	
Cookies & Cream	

Number of Votes for Candy

Totals

3 Musketeers	
Twix	
M & M's	
Snickers	
Licorice	

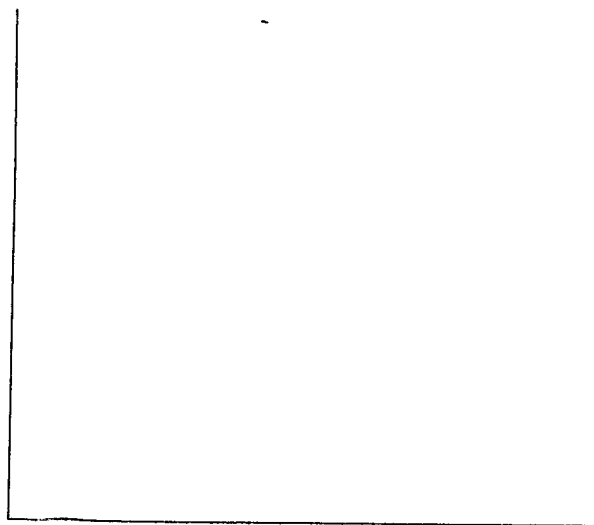
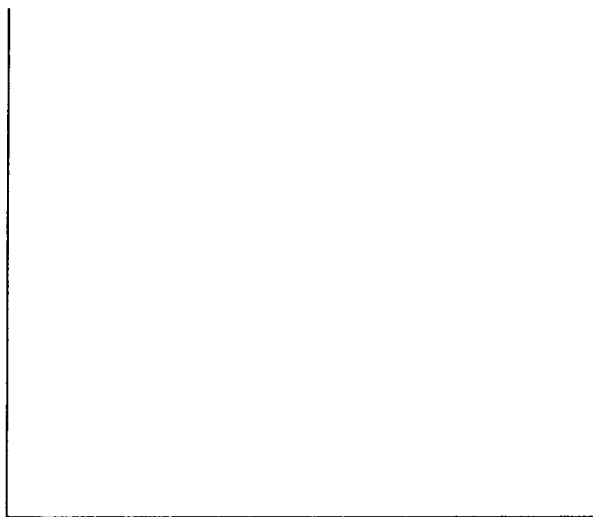
Tally Charts

_____ correct tallies
 _____ correct totals

Name _____ Date _____

GRAPHING

Directions: Using the tally charts, display the data on the bar graphs below.



BAR GRAPH

- ___ title
- ___ label both axes
- ___ numbers on lines
- ___ correct data displayed
- ___ numbers consistent
- ___ neat and organized

Name _____ Date _____

GRAPHING

Directions: Using the tally charts, display the data on the bar graphs below.

[illegible][illegible][illegible]

BAR GRAPH

- _____ title
- _____ label both axes
- _____ numbers on lines
- _____ correct data displayed
- _____ numbers consistent
- _____ neat and organized

Write a letter to the PTA explaining what 3 sodas, 3 ice creams, and 3 candies you would like them to buy for the carnival. Make sure to use your graphs to support your answer.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



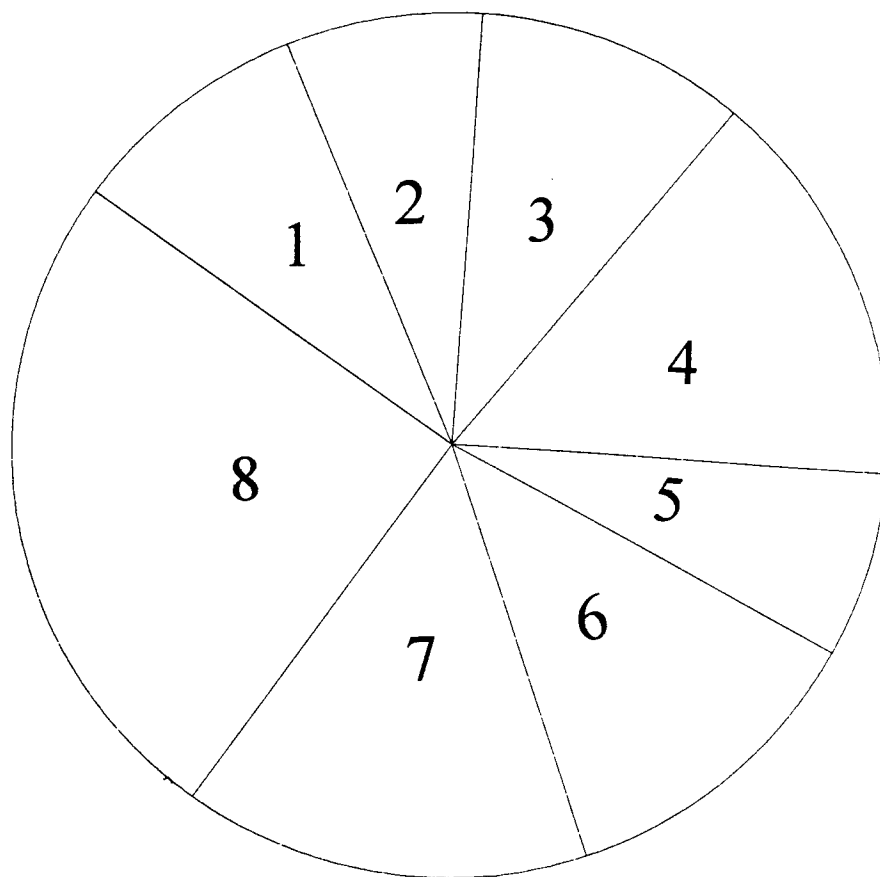
Introduction



The 4th grade class will be opening a probability booth. They designed the spinning wheel below.

Rules of the Game:

1. There is a number line with the numbers from 1-8 on the table that corresponds to the numbers on the spinning wheel.
2. Place a token on the number which you think will appear on the wheel when spun.
3. If your number is chosen, you win a prize.
4. Only one player is allowed on a number per spin.

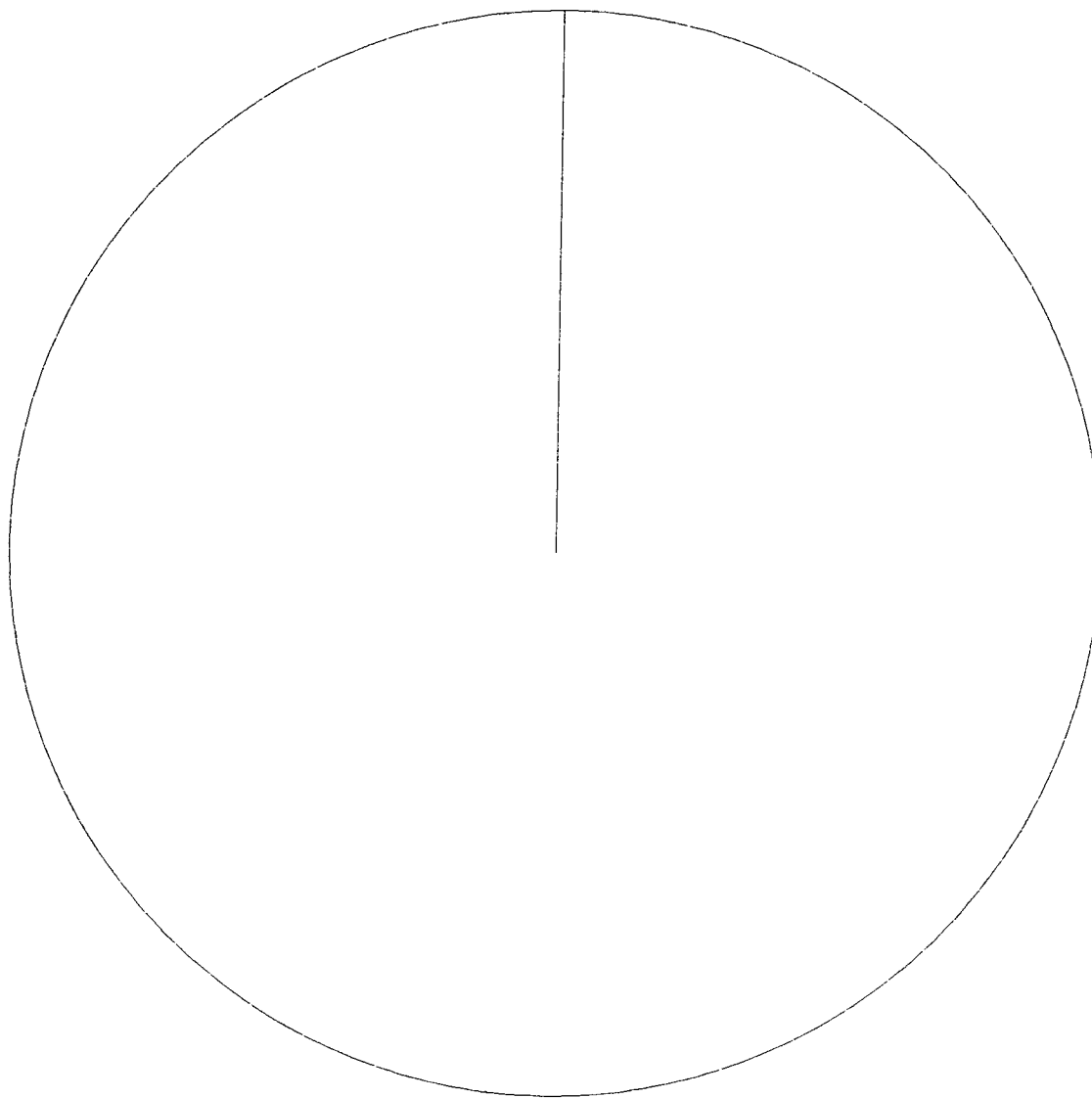


Will the spinning wheel be fair for all participants? _____ Explain.

Name _____ Date _____

MY FAIR SPINNER

Directions: Create a fair spinner with 8 sections numbered from 1-8. Use the spinner below.

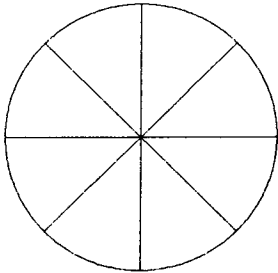


Explain to the 4th grade why your spinner is fair. _____

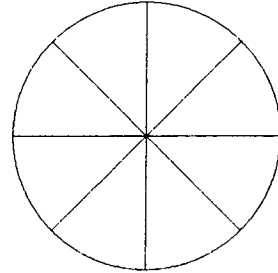
Name _____ Date _____

MATH JOURNAL

Spinner A

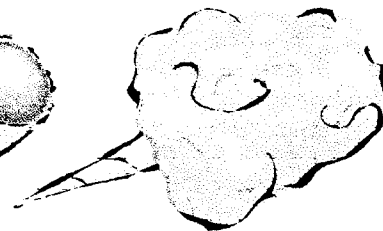
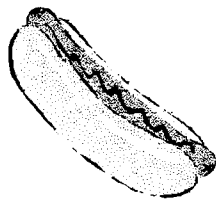


Spinner B

Color spinner A $\frac{2}{8}$ yellow, $\frac{1}{4}$ green, $\frac{1}{2}$ purple.Color spinner B $\frac{1}{4}$ red, $\frac{1}{4}$ blue, $\frac{1}{4}$ purple, $\frac{1}{4}$ orange.

Compare Spinner A and Spinner B using some of the math vocabulary listed below. You must use at least 4 words from the word bank.

more likely	less likely	equally likely	chance	outcomes	fair
unfair	impossible	certain	event	probability	



Name _____ Date _____

BAR GRAPH RUBRIC

Score 3

Graph is complete and includes all of the following :

all aspects of the graph are labeled, graph has an accurate title, graph is an appropriate size, data is accurate, lines are straight, labels are legible, and there is overall neatness in appearance.

Numbers include:

numbers are on the lines and NOT the spaces, numbers are equal units, numbers are appropriately spaced, and zero is on the bottom.

Axes include:

both Axes are labeled, units are marked, there is equal distance between numbers and equal distance between snack items.

Score 2

Graph is complete and missing only 1-2 of the following:

all aspects of the graph are labeled, graph has an accurate title, graph is an appropriate size, data is accurate, lines are straight, labels are legible, and there is overall neatness in appearance.

Numbers are missing only 1 of the following:

numbers are on the lines and NOT the spaces, numbers are equal units, numbers are appropriately spaced, and zero is on the bottom.

Axes are missing only 1 of the following:

both Axes are labeled, units are marked, there is equal distance between numbers and equal distance between snack items.

Score 1

Graph is complete and missing 4 or more of the following:

all aspects of the graph are labeled, graph has an accurate title, graph is an appropriate size, data is accurate, lines are straight, labels are legible, and there is overall neatness in appearance.

Numbers are missing 2 or more of the following:

numbers are on the lines and NOT the spaces, numbers are equal units, numbers are appropriately spaced, and zero is on the bottom.

Axes are missing 2 or more of the following:

both axes are labeled, units are marked, there is equal distance between numbers and equal distance between snack items.

Name _____ Date _____

WRITING RUBRIC

5	4	3	2	1
combines ideas in a variety of sentences	contains sentences	contains phrases	contains word groups	contains some related words
develops topic strongly	adheres to the topic	devotes adequate attention to topic	has limited attention to topic	does not adhere to topic
contains precise descriptions and details	has appropriate description and details	includes adequate descriptions and details	includes limited descriptions and details	includes very little if any descriptions and details
has well-developed sequential order	uses appropriate sequencing	uses sequencing noticeably	has limited use of sequencing	does not develop sequencing
shows originality, uniqueness, and inventiveness	reveals effective expression	has noticeable originality and creativity	has limited originality and creativity	contains little or no originality or creativity
contains no C.U.P.S. errors	contains 1-2 C.U.P.S. errors	contains 3-4 C.U.P.S. errors	contains 5-6 C.U.P.S. errors - hurts understanding	contains 7+ C.U.P.S. errors - no understanding

CUPS

C= capitalization U= usage of language P=punctuation S=spelling

RUBRIC PTA Letter

The writer:

- * correctly identifies and supports the 3 choices for soda (4 pts)
- * correctly identifies and supports the 3 choices for ice cream (4 pts)
- * correctly identifies and supports the 3 choices for candy (4 pts)
- * correct letter format (3 pts)
- * uses math language correctly (3 pts)
- * neat, legible handwriting (2 pts)

OVERALL GRADE _____ / 50 Comments: _____